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NATIONAL DAM SAFETY PROGRAM. OVERPECK TIDAL DAM (NJ00799), HACK--ETC(U)
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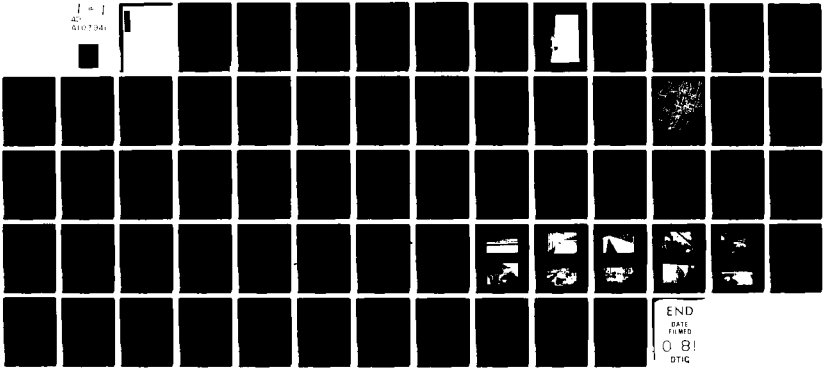

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REPORT DOCUMENTATION PAGE

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Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

National Dam Safety Program. Overpeck Tidal Dam (NJ 00799) Hackensack River Basin, Overpeck Creek, Bergen County, New Jersey. Phase I Inspection Report.

18. SUPPLEMENTARY NOTES

Copies are obtainable from National Technical Information Service, Springfield, Virginia 22151.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Dams	National Dam Safety Program
Embankments	Overpeck Tidal Dam, N.J.
Visual Inspection	Erosion
Structural Analysis	Spillways

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report cites results of a technical investigation as to the dam's adequacy. The inspection and evaluation of the dam is as prescribed by the National Dam Inspection Act, Public Law 92-367. The technical investigation includes visual inspection, review of available design and construction records, and preliminary structural and hydraulic and hydrologic calculations, as applicable. An assessment of the dam's general condition is included in the report.

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DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
CUSTOM HOUSE—2 D & CHESTNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

IN REPLY REFER TO

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31 AUG 1981

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Honorable Brendan T. Byrne
Governor of New Jersey
Trenton, New Jersey 08621

Dear Governor Byrne:

Inclosed is the Phase I Inspection Report for Overpeck Tidal Dam in Bergen County, New Jersey which has been prepared under authorization of the Dam Inspection Act, Public Law 92-367. A brief assessment of the dam's condition is given in the front of the report.

Based on visual inspection, available records, calculations and past operational performance, Overpeck Tidal Dam, initially listed as a high hazard potential structure but reduced to a low hazard potential structure as a result of this inspection, is judged to be in good overall condition and the spillway is considered adequate. The low hazard potential classification means that in the event of failure of the dam, no loss of life and only minimal economic loss is expected. For the same reasons no further studies are recommended. However, to assure the continued functioning of the dam and its impoundment, the following remedial actions could be undertaken by the owner:

a. Inspect the erosion protection along the toe of the cofferdams on either side of the dam, both upstream and downstream, during low water condition, and implement remedial measures, if required.

b. Implement remedial measures for the corrosion on the vertical steel stoplog supports.

c. Implement remedial measures as required for the deterioration of the concrete below the waterline of the piers.

d. Establish grass, vegetation, or cover on the crest surface of the cofferdam on left downstream side and use asphalt along the right downstream side of the dam.

e. Develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam.

NAPEN-N
Honorable Brendan T. Byrne

A copy of the report is being furnished to Mr. Dirk C. Hofman, New Jersey Department of Environmental Protection, the designated State Office contact for this program. Within five days of the date of this letter, a copy will also be sent to Congressman Hollenbeck of the Ninth District. Under the provision of the Freedom of Information Act, the inspection report will be subject to release by this office, upon request, five days after the date of this letter.

Additional copies of this report may be obtained from the National Technical Information Services (NTIS), Springfield, Virginia 22161 at a reasonable cost. Please allow four to six weeks from the date of this letter for NTIS to have copies of the report available.

An important aspect of the Dam Inspection Program will be the implementation of the recommendations made as a result of the inspection. We accordingly request that we be advised of proposed actions taken by the State to implement our recommendations.

Sincerely,

ROGER L. BALDWIN
Lieutenant Colonel, Corps of Engineers
Commander and District Engineer

Incl
As stated

Copies furnished:
Mr. Dirk C. Hofman, P.E., Deputy Director
Division of Water Resources
N.J. Dept. of Environmental Protection
P.O. Box CN029
Trenton, NJ 08625

Mr. John O'Dowd, Acting Chief
Bureau of Flood Plain Regulation
Division of Water Resources
N.J. Dept. of Environmental Protection
P.O. Box CN029
Trenton, NJ 08625

OVERPECK TIDAL DAM (NJ00799)

CORPS OF ENGINEERS ASSESSMENT OF GENERAL CONDITIONS

This dam was inspected on 24 April 1981 by Anderson-Nichols and Co. Inc., under contract to the State of New Jersey. The State, under agreement with the U.S. Army Engineer District, Philadelphia, had this inspection performed in accordance with the National Dam Inspection Act, Public Law 92-367.

Overpeck Tidal Dam, initially listed as a high hazard potential structure but reduced to a low hazard potential structure as a result of this inspection, is judged to be in good overall condition and the spillway is considered adequate. The low hazard potential classification means that in the event of failure of the dam, no loss of life and only minimal economic loss is expected. For the same reasons no further studies are recommended. However, to assure the continued functioning of the dam and its impoundment, the following remedial actions could be undertaken by the owner:

a. Inspect the erosion protection along the toe of the cofferdams on either side of the dam, both upstream and downstream, during low water condition, and implement remedial measures, if required.

b. Implement remedial measures for the corrosion on the vertical steel stoplog supports.

c. Implement remedial measures as required for the deterioration of the concrete below the waterline of the piers.

d. Establish grass, vegetation, or cover on the crest surface of the cofferdam on left downstream side and use asphalt along the right downstream side of the dam.

e. Develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam.

APPROVED: Roger Baldwin

ROGER L. BALDWIN
Lieutenant Colonel, Corps of Engineers
Commander and District Engineer

DATE: 31 Aug 81

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	Overpeck Tidal Dam
Identification No.:	Fed ID No. NJ00799
State Located:	New Jersey
County Located:	Bergen
Stream:	Overpeck Creek
River Basin:	Hackensack
Date of Inspection:	April 24, 1981

ASSESSMENT OF GENERAL CONDITIONS

Overpeck Tidal Dam is about 27 years old and is in good condition. The dam is a gated concrete structure 296.4 feet long, 17.6 feet high and 61 feet wide consisting of 13 compartmentalized sections each 20 feet wide between the bridge piers for the northbound lane of the New Jersey Turnpike that passes over the dam. Two bascule gates and four Tainter gates actuated by floats and automated controls maintain gate openings and closings to control both the riverine and the tidal side water levels. Primarily, the dam protects low lying land and structures on the riverine side. These gates are located in the left 6 bays, three on either side of the control chamber, with the bascule gates adjacent to the sides of the control chamber. Seven 20-foot sections of three bays each contain stop logs to the right of the mechanical gates. The abutments consist of earth-filled cofferdams or caissons. Erosion was observed of the slope protection at the toe of the right downstream cofferdam and along the crest of this cofferdam. The asphalt surface of the left downstream cofferdam crest has some small depression up to 8 inches in diameter. Minor erosion was noted on the crests of both right and left upstream cofferdams. The steel stoplog supports are rusted at the waterline. The concrete piers are surface eroded exposing coarse aggregate at the waterline. Steel sheeting along the upstream and downstream channel walls is rusted. The vegetative cover on the abutment rests was generally good but needs trimming.

Overpeck Tidal Dam does not pose a potential hazard to loss of life and only minimal property damage could occur if it should be breached. However, should the owner wish to maintain the integrity of the dam, he should retain the services of a professional engineer, qualified in the design and construction of dams to accomplish the following in the near future: inspect the erosion protection along the toe of the cofferdams on either side of the dam, both upstream and downstream, during low water condition, and design remedial measures, if required; evaluate the impact of the corrosion on

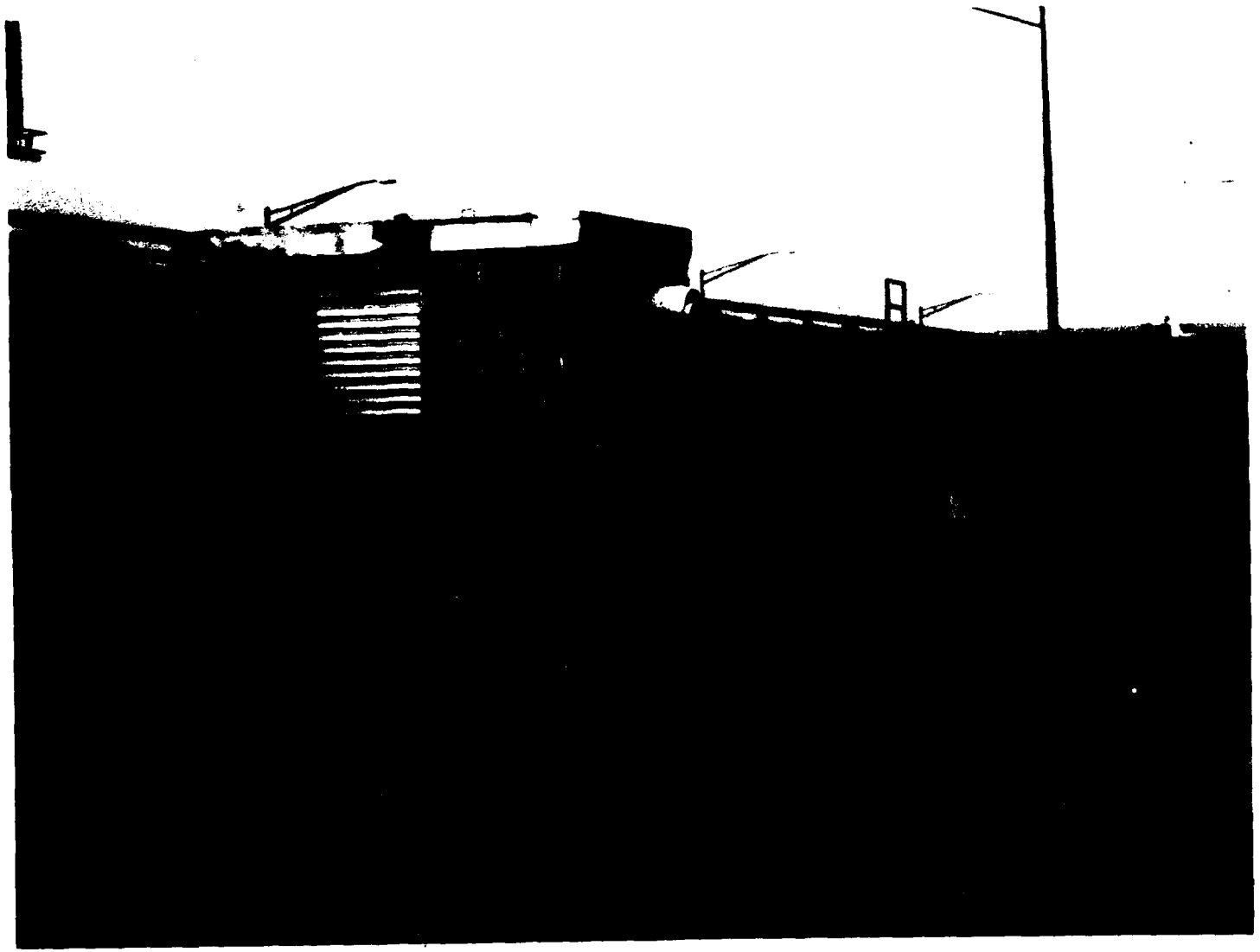
the vertical steel stoplog supports and design and oversee remedial measures; and evaluate the extent and impact of the deterioration of the concrete below the waterline of the piers.

It is further recommended that the owner undertake the following as a part of operating and maintenance procedures in the near future: Establish grass, vegetation, or cover the crest surface of the cofferdam on left downstream side and use asphalt along the right downstream side of the dam; and develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam.

ANDERSON-NICHOLS & COMPANY, INC.

Warren A. Guinan

Warren A. Guinan, P.E.
Project Manager
New Jersey No. 16848



April 24, 1981

OVERVIEW PHOTO

OVERPECK TIDAL DAM

PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test Flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonable possible storm runoff), or fractions thereof. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.

CONTENTS

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY REPORT

OVERPECK TIDAL DAM FED ID NO. NJ00779

PHASE I INSPECTION REPORT
NATIONAL DAM SAFETY INSPECTION PROGRAM
OVERPECK TIDAL DAM
FED ID NO. #NJ00799

SECTION 1
PROJECT INFORMATION

1.1 General

a. Authority. Authority to perform the Phase I Safety Inspection of Overpeck Tidal Dam was received from the State of New Jersey, Department of Environmental Protection, Division of Water Resources by letter dated 12 December 1980 under Basic Contract No. FPM-39, and Contract No. A01093 dated 10 October 1979. This Authority was given pursuant to the National Dam Inspection Act, Public Law 92-367 and by agreement between the State and the U.S. Army Engineers District, Philadelphia. The inspection discussed herein was performed by Anderson-Nichols & Company, Inc.

b. Purpose: The purpose of the Phase I Investigation is to develop an assessment of the general conditions with respect to the safety of Overpeck Tidal Dam and appurtenances. Conclusions are based upon available data and visual inspection. The results of this study are used to determine any need for emergency measures and to conclude if additional studies, investigations, and analyses are necessary and warranted.

1.2 Project Description

a. Description of Dam and Appurtenances. Overpeck Tidal Dam is a 296.4-foot long, 12.6-foot high, poured concrete dam with caisson earthfilled abutments. The dam is underneath, and integrally built into, a New Jersey turnpike bridge. The dam has six automatic, electrically operated, mechanical gates, two 20-foot wide x 13.6-foot high bascule gates and four 20-foot wide x 9.5-foot high tainter gates. In addition, the dam has a 152-foot long stoplog structure composed of seven sections, each 20-foot wide x 9.1-foot high. Each stoplog section has 3 bays. The thirteen compartmentalized sections of the dam have been designed to accept additional stoplogs at each end of the piers for dewatering. A walkway over the entire dam length is at an elevation of 11.75' NGVD. A 9.33-foot wide control chamber is located between the two bascule gates. The controls, electrical panels, and hydraulic equipment to operate the bascule gates, and recording devices are located in this chamber, as well as an emergency power generator.

b. Location. Overpeck Tidal Dam is located on Overpeck Creek in Ridgefield Borough, Bergen County, New Jersey. The dam is shown on U.S.G.S. Quadrangle, Weehawken, New Jersey-New York, with approximate coordinates of N40° 50.4' W74° 01.1'. The control house on the dam crest is reached via Interchange 18 onto the north bound lane of the New Jersey Turnpike. The control house is immediately accessible by stopping in the breakdown lane at the middle of the bridge at Overpeck Creek Crossing. Other portions of the dam must be reached similarly by approaching on the south bound lane. A location map has been included as Figure 2.

c. Size Classification. Overpeck Tidal Dam is classified as being intermediate in size on the basis of storage at top of dam of 5,122 acre-ft, which is less than 50,000 acre-feet but more than 1,000 acre-feet, in accordance with criteria given in the Recommended Guidelines for Safety Inspection of Dams.

d. Hazard Classification. The hazard area related to Overpeck Tidal Dam is in the area upstream of the dam. No downstream hazard was identified. In the event of either a breach or overtopping from the riverine side of the dam, property damage would be minimal and few, if any, lives would be lost or endangered. For this reason, it is recommended that for Overpeck Tidal Dam the initial high hazard classification be reduced to low hazard.

e. Ownership. The dam is owned by Bergen County, New Jersey. Information may be obtained by writing Mr. Barry Ricciardi, Chief Hydraulic Engineer, 29 Linden Street, Hackensack, New Jersey 07602 or by calling (201) 646-2853.

f. Purpose. Overpeck Tidal Dam was constructed to prevent tidal flow into Overpeck Creek in conjunction with prevention of pollution of Overpeck Creek after construction of a trunk sewer removed the then present effluent discharge of various towns in Overpeck Valley.

g. Design and Construction History. Reproducible plans for Overpeck Tidal Dam are available. They are dated 1950 and done by Seelye, Stevenson & Value. Plans for the Reconstruction of Overpeck Creek Tide Gates are dated 1977 and were done by McPhee, Smith and Rosenstein. The plans were verified in the field and were generally found to be accurate.

h. Normal Operational Procedure. The bascule and tainter gates are operated automatically based on riverine and tidal water level as measured by floats. An operating schedule for Overpeck Tidal Dam exists. A copy can be found in Appendix 1, 'Engineering and Experience Data.'

i. Site Geology. No site specific geologic information (such as borings) was available at the time the dam was inspected. Information derived from the Geologic Map of New Jersey (Kummel and Johnson, 1912) and the Gacial Drift Map of New Jersey (Salisbury, Kummel, Peet and Whitson, 1902) indicates that soils within the immediate site consist of stratified drift which may be comprised of some sand and gravel plains, deltas, eskers, kames, and terraces.

The depth to bedrock at the dam site is unknown, and outcrops were not observed during the site visit. The previously mentioned map indicates that bedrock in the area consists of red shale and sandstone of Triassic age.

1.3 Pertinent Data

a. Drainage Area

16.5 square miles

b. Discharge at Damsite (cfs)

Maximum flood at damsite - unknown

Total gated spillway capacity at maximum pool elevation (Top of dam) - 8,323 (using only the 2 bascule and 4 tainter gates)

c. Elevation (ft. above NGVD)

Top of dam - 6.7

Maximum pool test flood (100-year peak flow) - 1.78

Recreation pool (at time of inspection) - 1.0 upstream
- 2.5 downstream

Spillway crest - Bascule Gate Sections: -1.6 (below NGVD)
Tainter Gate Sections: -2.3 (below NGVD)

Streambed at centerline of spillway (estimated) - 14.0 (below NGVD)

Maximum tailwater - 7.96 feet, September 12, 1960 (See page 1-2, Appendix 1)

d. Reservoir (feet)

Length of maximum pool - 22,400 (estimated)

Spillway crest - 16,800

e. Storage (acre-feet)

Spillway crest - Intergate spillway crest is 2.3 feet below NGVD, i.e. at about the elevation of mean low water; therefore at the spillway crest, storage is zero.

Top of dam - 5121.8

Test flood - (100-year peakflow) - 680

f. Reservoir Surface (acres)

Top of dam - 1427.2

Spillway crest - 129.4

g. Dam

Type - Tidal dam, concrete with caisson, earthfilled abutments

Length - 296.4 feet

Height - 12.6 feet (hydraulic)

- 17.6 feet (structural)

Top width - 61 feet

Side slopes - Vertical faces

Zoning - unknown

Impervious core - unknown

Cutoff - unknown

Grout curtain - unknown

h. Spillway

Type - Gated

Length of weir - Bascule Gate Section: 40 feet (2 gates)

- Tainter Gate Section: 80 feet (4 gates)

Crest elevation - Bascule Gate Section: - 1.6' below NGVD

- Tainter Gate Section: - 2.3' below NGVD

U/S Channel - Overpeck Creek

D/S Channel - Overpeck Creek

i. Stoplog Spillway

Type - wood planks

Length of weir - 140 feet

Crest elevation - 6.7' NGVD (with stoplogs)

- 2.3' below NGVD (without stoplogs)

U/S channel - Overpeck Creek

D/S channel - Overpeck Creek

SECTION 2
ENGINEERING DATA

2.1 Design

No hydrologic, hydraulic or engineering design computational data were disclosed. The engineering design data on file at the New Jersey Department of Environmental Protection consisted of an Application for Permit for Construction, a copy of which is included in Appendix 1. A complete set of design plans are on file at the Bergen County Engineer office, 29 Linden Street, Hackensack, N.J. 07602. The general design plan shows a 296.4-foot long dam. The gated spillway has two 20-foot bascule gates and four 20-foot tainter gates. The stoplog section is 140-foot long. The plans give elevations and show cross sections and detail drawings for numerous parts of the dam, including gate reconstruction and rehabilitated electrical circuits.

2.2 Construction

No construction data were disclosed. Contact with both the New Jersey Turnpike Authority and Seelye, Stevenson, Value and Knecht resulted in negative responses with regard to design and construction data.

2.3 Operation

An operating schedule for Overpeck Tidal Dam was found in the New Jersey Department of Environmental Protection files. A copy is included in Appendix 1. The Bergen County Engineering Office has manuals for all gate and electrical operating equipment published by Allis-Chalmers, gate manufacturers.

2.4 Evaluation

a. Availability. A search of the New Jersey Department of Environmental Protection and the Bergen County Engineer office files and contact with community officials revealed a significant amount of information. All disclosed information with copies of more pertinent plans was retrieved.

b. Adequacy. The plans, supplemented by visual inspection, are deemed adequate to complete this inspection.

SECTION 3
VISUAL INSPECTION

3.1 Findings

a. Dam. Several small depressions up to 8 inches in diameter have developed in the asphalt surface which covers the top of the left cofferdam, located along the downstream side of the dam. Some erosion is occurring along the crest of the right cofferdam, which is bare of vegetation, and located on the downstream side of the dam. Erosion of slope protection at the toe of the right downstream cofferdam was observed. Generally the grass cover is good, but needed trimming.

On the upstream side of the dam, minor erosion has occurred on the crest of the cofferdams located on either side of the dam.

b. Appurtenant Structures. The steel stoplog supports are rusted at the waterline and the wood stoplogs are weathered. The concrete piers are surface eroded exposing the cause aggregate; and the steel sheeting along the upstream and downstream channel walls are rusted. The bascule gates, tainter gates and control building are all in excellent condition. No visible leakage was noted from any seal. The gates are operated automatically and were tested successfully. The emergency diesel generator was run and all instruments observed to be in working order. The generator is properly vented and housed in the control building.

c. Reservoir Area. The watershed above the river grades from low-lying tidal marsh to urbanized areas containing houses and factories. Slopes along the river appear to have undergone some minor sloughing; otherwise, they appear to be stable. No evidence of significant sedimentation was observed.

d. Downstream Channel. Some erosion of the right and left river channel banks is taking place downstream of the dam.

SECTION 4
OPERATIONAL PROCEDURES

4.1 Procedures

Brief operating procedures can be found in the operating schedule on file at New Jersey Department of Environmental Protection, a copy of which is included in Appendix 1.

4.2 Maintenance of Dam

No formal (written) maintenance procedures for the dam were disclosed.

4.3 Maintenance of Operating Facilities

Maintenance and operating procedures manuals for installed equipment pertinent to the bascule and tainter gates, electrical controls, and standby generating equipment were on file in the Bergen County Engineer Office from Allis-Chalmers, the manufacturer.

4.4 Warning System

The dam has a warning system for 14 operational aspects such as power failure (automatically switches on the emergency generator), higher riverine level than normal (+ 3.5 feet), lower riverine level than normal (+ 0.6 foot) and gate operation malfunction. When one of the alarms goes off it is automatically transmitted to the alarm system company that is on 24-hour operation. The alarm company notifies one of 12 Bergen County Engineer personnel on a roster who then proceeds to the control house on the dam to evaluate the problem and initiate action to remedy the situation.

4.5 Evaluation of Operational Adequacy

Because of the lack of written maintenance procedures for the dam, the remedial measures described in Section 7.2 should be implemented as prescribed.

SECTION 5
HYDROLOGIC/HYDRAULIC

5.1 Evaluation of Features

a. Design Data. Because no original hydrologic/hydraulic design data were revealed, an evaluation of such data could not be performed.

b. Experience Data. A limited amount of Flood Hazard data was available and was used as supplemental information.

c. Visual Inspection. No leaks around gate seals were observed. Minor leakage had been corrected in stoplogs by straw packing. Gates are all operational and automated; they were replaced in 1977-78.

d. Overpeck Tidal Dam Overtopping Potential. The hydraulic/hydrologic evaluation for the dam is based on a selected Spillway Design Flood (SDF) equal to the 100-year flood in accordance with the range of test floods given in the evaluation guidelines, for dams classified as low hazard and intermediate in size. The 100-year flood discharge was determined by Stephen J. Stankowski's method as outlined in "Magnitude and Frequency of Floods in New Jersey with Effects of Urbanization", Special Report #38, 1974. Hydrologic computations are given in Appendix 4. The 100-year discharge for the subject watershed is 2,414 cfs. Assuming either a low or high tide and the 6 mechanical gates to be opened, the spillway can pass the 100-year flood without overtopping the dam embankment and is considered adequate.

SECTION 6
STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

Continued erosion of the crest of the cofferdams located at the abutments of the dam will affect the stability of these structures if it is not controlled. Similarly, erosion of the slope protection at the toe of the right downstream cofferdam will affect the stability of this structure if not controlled. Continued erosion of the steel stoplog supports could lead to failure of a stoplog section.

6.2 Design and Construction Data

No design or construction data pertinent to the structural stability of the dam were available.

6.3 Operating Records

No operating records pertinent to the structural stability of the dam were available.

6.4 Post-Construction Changes

The drawings for replacement of bascule and tainter gates and electrical wiring details were available; these are the only known post-construction changes.

No records of post-construction changes are available.

6.5 Seismic Stability

This dam is in Seismic Zone 1. According to the Recommended Guidelines, dams located in Seismic Zone 1 "may be assumed to present no hazard from earthquake provided static stability conditions are satisfactory and conventional safety margins exist." None of the visual observations made during the inspection are indicative of unstable slopes. However, because no data are available concerning the engineering properties of the embankment and foundation materials for this dam, it is not possible to make an engineering evaluation of the stability of the slopes or the factor of safety under static conditions.

SECTION 7
ASSESSMENT, RECOMMENDATIONS/REMEDIAL MEASURES

7.1 Dam Assessment

a. Condition. Overpeck Tidal Dam is approximately 27 years old and is in good condition.

b. Adequacy of Information. The information available is such that the assessment of the dam must be based primarily on the results of the visual inspection.

c. Urgency. Because the dam poses no hazard to life and little hazard to property there is little urgency to implement the recommendations in Section 7.2 based on safety considerations. Should the owner wish to maintain the dam, the recommendations should be implemented as prescribed.

d. Necessity for Additional Data/Evaluation. The information available from the visual inspection is adequate to identify the potential problems which are listed in 7.2.a. These problems require the attention of a professional engineer who will have to make additional engineering studies to design or specify remedial measures to rectify the problems. If left unattended, the problems could lead to failure of the dam.

7.2 Recommendations/Remedial Measures

a. Recommendations. The owner should engage a professional engineer qualified in the design and construction of dams to accomplish the following in the near future:

1. Inspect the erosion protection along the toe of the cofferdams on either side of the dam, both upstream and downstream, during low water condition, and design remedial measures, if required.

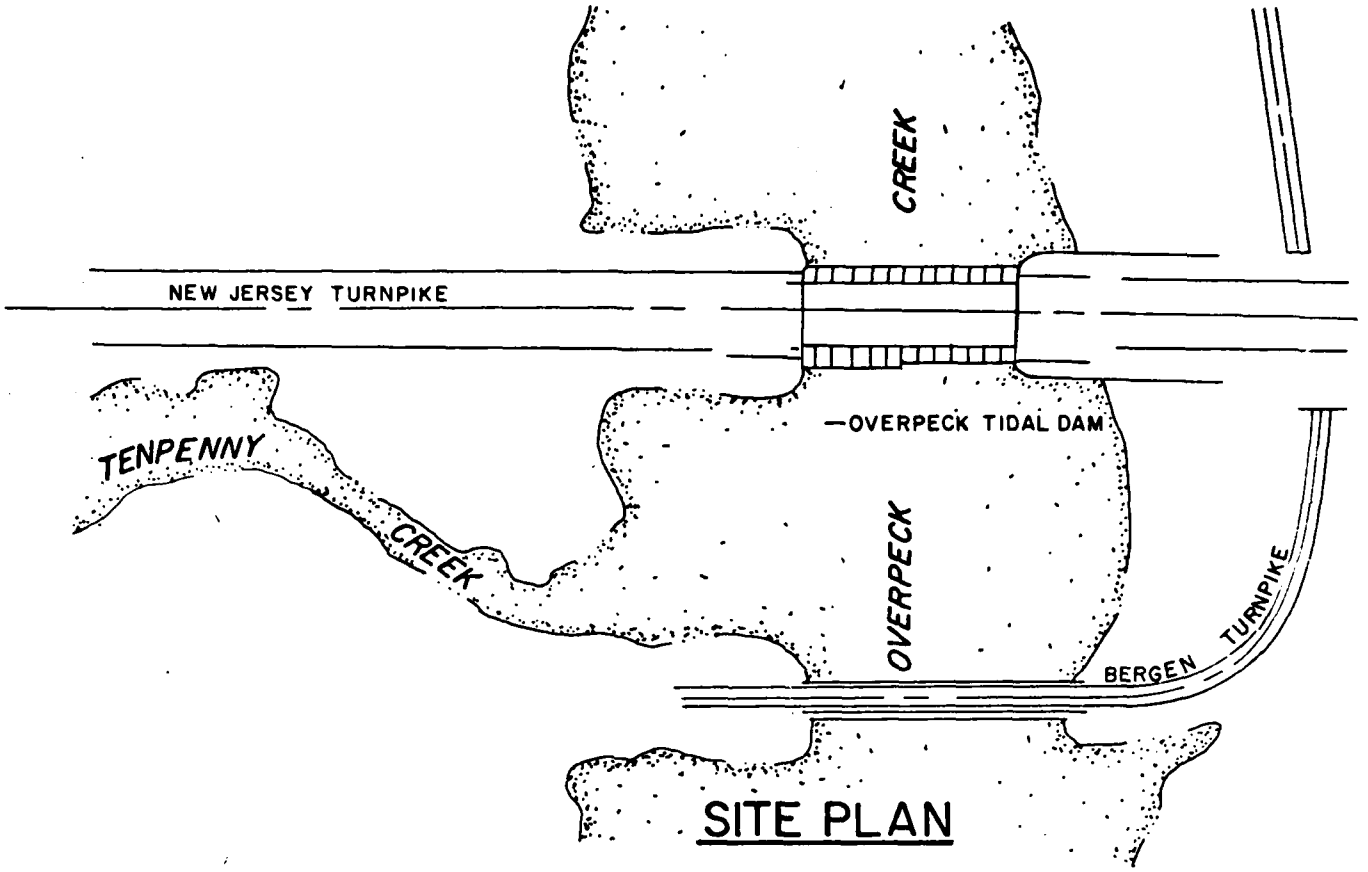
2. Evaluate the impact of the corrosion on the vertical steel stoplog supports and design and oversee remedial measures.

3. Evaluate the extent and impact of the deterioration of the concrete below the waterline of the piers.

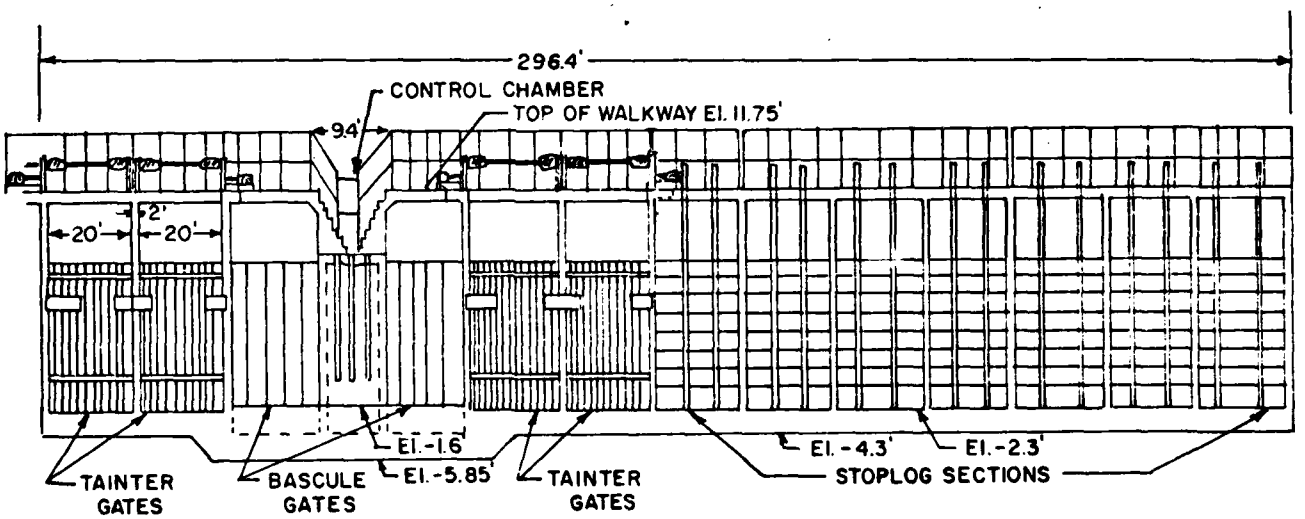
b. Operating and Maintenance Procedures. The owner should accomplish the following in the near future:

1. Establish grass, vegetation, or cover the crest surface of the cofferdam on left downstream side and use asphalt along the right downstream side of the dam.

2. Develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam.



SITE PLAN



ELEVATION

Anderson-Nichols & Co, Inc BOSTON MASSACHUSETTS	U.S. ARMY ENGINEER DIST PHILADELPHIA CORPS OF ENGINEERS PHILADELPHIA, PA

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

OVERPECK TIDAL DAM

OVERPECK CREEK NEW JERSEY

			SCALE NOT TO SCALE
			DATE JUNE 1981

FIGURE -1

SCALE IN MILES

0 4 8

MAP BASED ON STATE OF NEW JERSEY OFFICIAL MAP & GUIDE.

Anderson-Nichols & Co, Inc.
BOSTON MASSACHUSETTS

U.S. ARMY ENGINEER DIST. PHILADELPHIA
CORPS OF ENGINEERS
PHILADELPHIA, PA.

NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

OVERPECK TIDAL DAM
LOCATION MAP

OVERPECK CREEK — NEW JERSEY

SCALE: 1" = 4 Mi. Approx.

DATE: JUNE 1981

FIGURE - 2

APPENDIX 1

ENGINEERING AND EXPERIENCE DATA

OVERPECK TIDAL DAM

FLOOD HAZARD BOUNDARY MAP H-01
FLOOD INSURANCE RATE MAP I-01

BOROUGH OF RIDGEFIELD, NEW JERSEY
BERGEN COUNTY

PANEL H&I-01

EFFECTIVE DATE:
MARCH 15, 1977

COMMUNITY NUMBER:
340065A

U.S. DEPARTMENT OF HOUSING
AND URBAN DEVELOPMENT
FEDERAL INSURANCE ADMINISTRATION

HISTORY OF FLOODING

The Village of Ridgefield Park is bounded on three sides with two large waterways which are the Hackensack River and the Overpeck Creek.

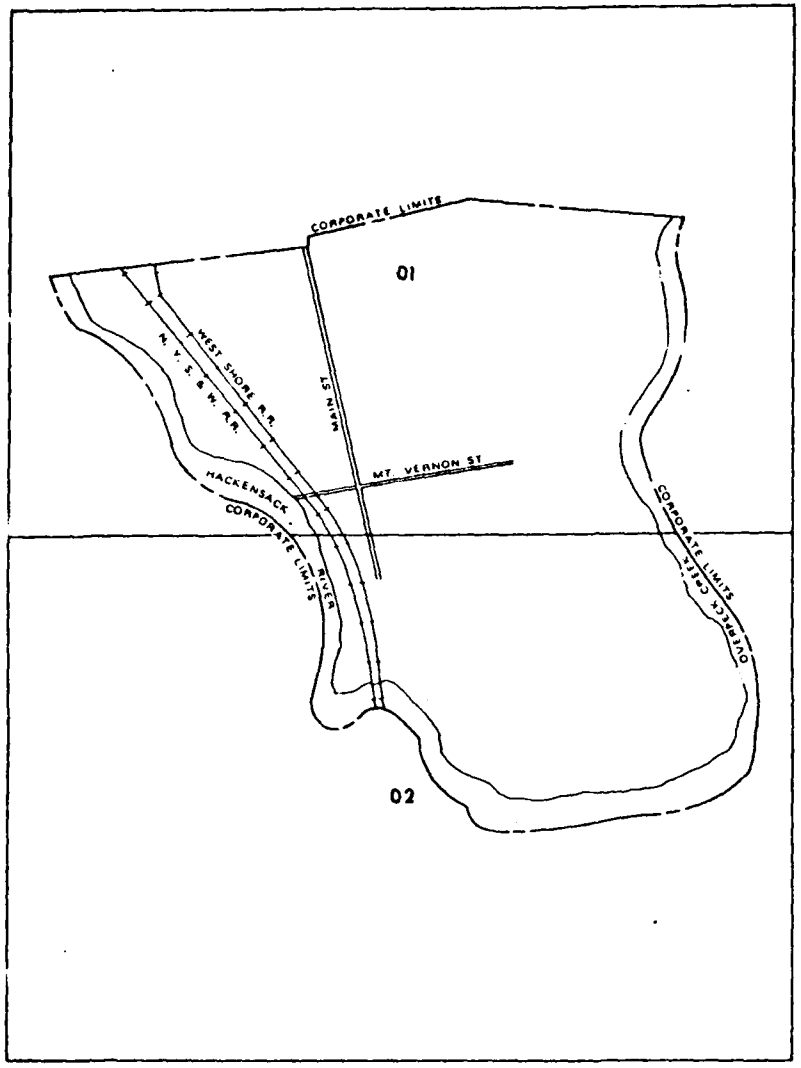
The area along the Overpeck Creek, being the easterly boundary of the Village, has been improved by the installation of tide gates at the New Jersey Turnpike Roadway. This has eliminated excessive high tides from entering the area above this point. Also, the County of Bergen has dredged the new "Overpeck Lake Area" which gives this area additional capacity. These gates were constructed approximately 20 years ago and since this time, the flood problem, upstream, has not seriously affected structures built in the lower elevations along the Overpeck Lake Area. The Ridgefield Park High School, Scott Court Apartments, and Christie Street Apartments have been constructed within the last ten years and have not been inundated by flooding. Until detailed hydraulic data is submitted, the Village of Ridgefield Park cannot comment on the exact delineation of the "flood hazard area."

The remaining area of the Overpeck Creek from the New Jersey Turnpike south to the Hackensack River and all of the Hackensack River bordering the westerly limits of the Village of Ridgefield Park are controlled by tidal elevations. Excessive high tide coupled with prolonged heavy rains cause damage to the portions of properties along this area. The Army Corps of Engineers recorded a record high tide at Court Street, Hackensack on September 12, 1960 of Elevation 7.96 on the Hackensack River. We believe this was the highest elevation recorded in over 50 years.

Until a more detailed topographical survey is prepared and exact elevations are set for all flood hazard areas, we cannot determine the exact area affected.

RIDGEFIELD PARK FLOOD HAZARD AREA

		Estimated Population
107	1-Family Houses	428
21	2-Family Houses	126
23	Small Businesses	
22	Industrial Warehouse Buildings	
1-126 units		252
1- 60 units		120
1- 93 units		186
1- 6 units	Apartment Buildings	12
		1,124
1	Radio Station Building	
1	High School	



LEGEND

SPECIAL FLOOD HAZARD AREA WITH DATE OF IDENTIFICATION — ZONE A, DATE

Note: These maps may not include all Special Flood Hazard Areas in the community. After a more detailed study, the Special Flood Hazard Areas shown on these maps may be modified, and other areas added.

CONSULT NFIA SERVICING COMPANY OR LOCAL INSURANCE AGENT OR BROKER TO DETERMINE IF PROPERTIES IN THIS COMMUNITY ARE ELIGIBLE FOR FLOOD INSURANCE.

INITIAL IDENTIFICATION DATE:

JUNE 28, 1974

REVISION DATES

1-2-76 ADD S F H A, REDUCE S F H A, SHOW CURVILINEAR BOUNDARIES

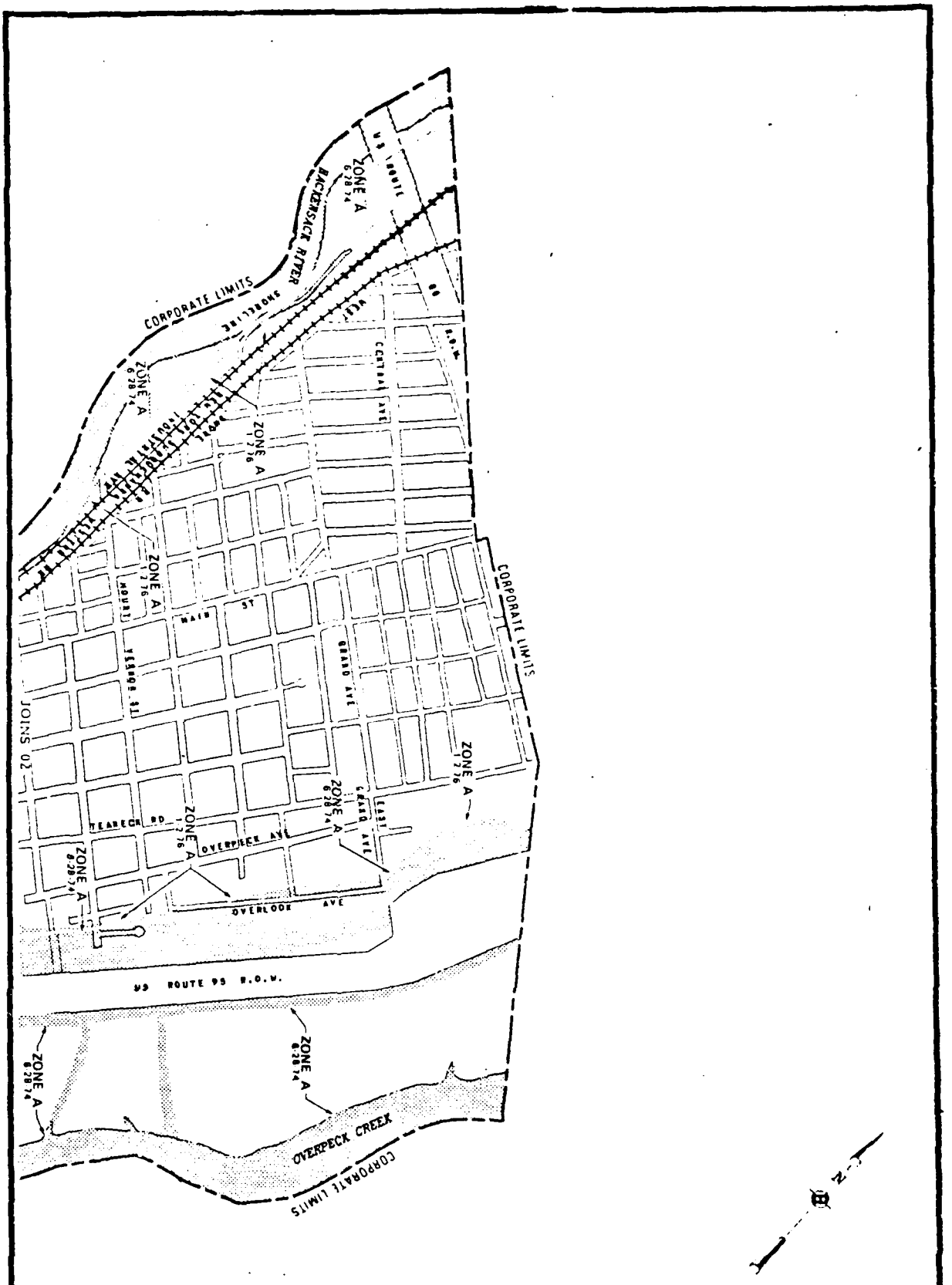
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
Federal Insurance Administration

FLOOD HAZARD BOUNDARY MAP H - 01-02

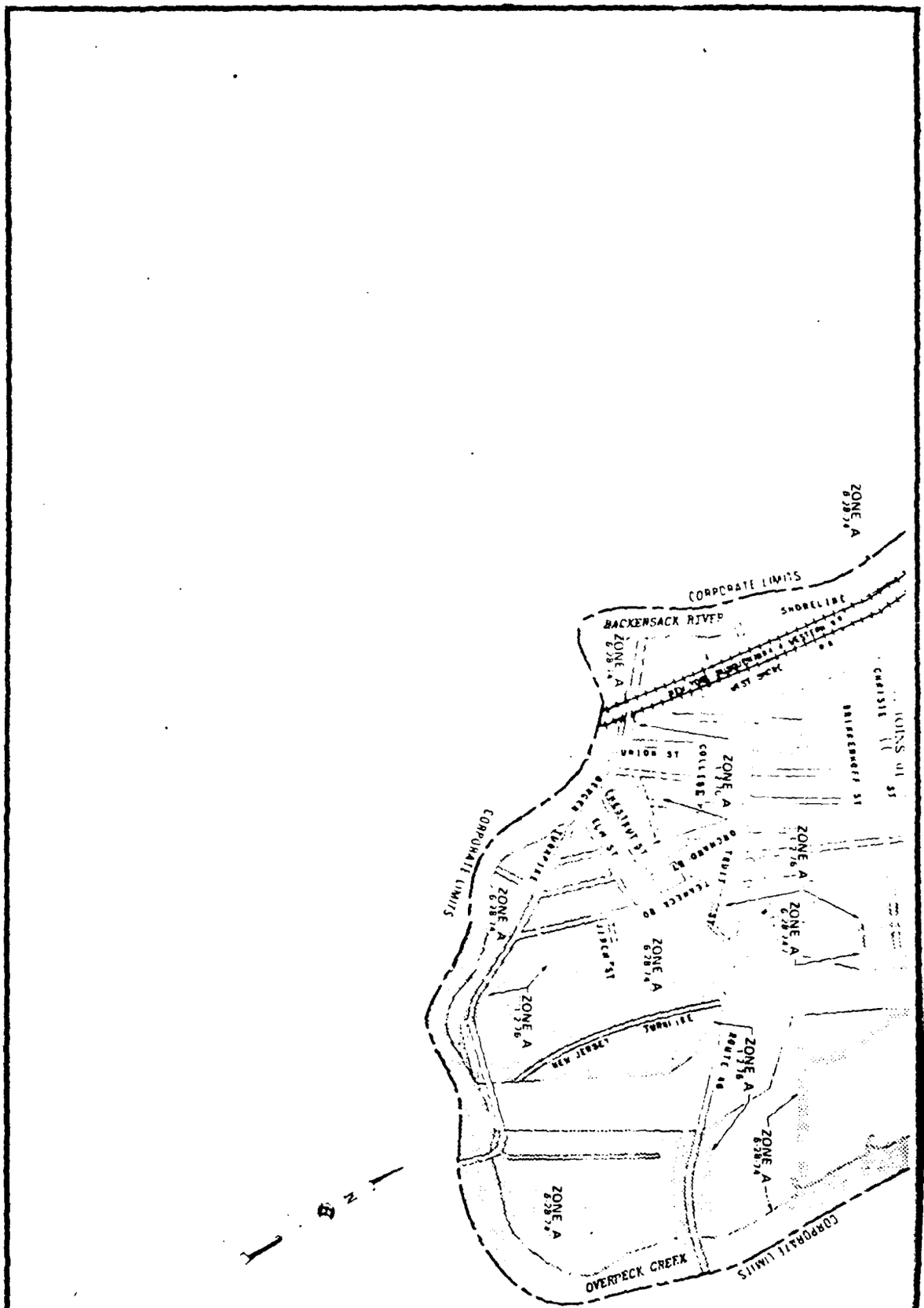
MAP INDEX

VILLAGE OF RIDGEFIELD PARK, NJ
(BERGEN CO.)

COMMUNITY NO. 340066A



10	DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT Federal Insurance Administration VILLAGE OF RIDGEFIELD PARK, NJ (BERGEN CO.)	APPROXIMATE SCALE 500 0 1000 2000 3000 FEET	
		FIA FLOOD HAZARD BOUNDARY MAP No H 01	Map Revised JANUARY 2, 1976



20	DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT Federal Insurance Administration VILLAGE OF RIDGEFIELD PARK, NJ (BERGEN CO.)	APPROXIMATE SCALE 500 0 1000 2000 3000 FEET	
		FIA FLOOD HAZARD BOUNDARY MAP No H 07	Map Revised JANUARY 2, 1976

RECEIVED

OCT 1 - 1938

STATE WATER POLICY COMMISSION

STATE OF NEW JERSEY

STATE WATER POLICY COMMISSION

28 WEST STATE STREET

TRENTON, NEW JERSEY

Encroachment Application No. _____

APPLICATION FOR PERMIT FOR CONSTRUCTION OF ~~STREAM ENCROACHMENT~~ DAM

Ridgefield Park, New Jersey

September 28, 1938

To the New Jersey State Water Policy Commission,

Gentlemen:—

In compliance with the provisions of Chapter 367, P. L. 1929

Overpeck Creek Valley Joint Meeting Committee

(Here insert name of public authority, private person or corporation)

hereby makes application for the approval of plans and for the issuance of a permit for the construction (alteration) of a Dam, Earth fill and concrete spillway

(Kind of structure—bridge, culvert, trestle, rock fill, etc.)

in, under or across the Overpeck Creek

(Here insert name of stream or other body of water.)

at a point 90 East of Bergen Turnpike Ridgefield to Ridgefield Park

(Here give location by village, nearest intersection, highway, or other political division.)

where the tributary drainage area is 17.8 square miles, for the purpose of Preventing tidal flow into Overpeck Creek in conjunction with prevention of pollution of Overpeck Creek after construction of trunk sewer has removed present effluent discharges of various towns in Overpeck Valley

(Here state fully the purpose, necessity and description of the proposed structure.)

In accordance with drawings and other data filed with this application and made part hereof, as follows:

1. Drawings.
   - (a) Location map.
   - (b) Plan of structures.
   - (c) Elevations and sections of structures.
   - (d) Profile of stream bed and flow lines above and below structure.
   - (e) Cross-sections of stream channel.
   - (f) Results of borings, or other sub-surface investigations, if made.
   - (g) Specifications (for retaining walls only).
2. Record of observed flood flows (quantity, date, authority) State Board of Health flood waste 1936
3. Description of watershed (slopes, culture, soil) Suburban development
4. Character of stream bed and banks Mud 7' deep in clay
5. Description of hydraulic control below structure, if any See plans

The following information also should be submitted if available:

1. Is structure new or a replacement of an existing encroachment? New
2. Age of existing encroachment None
3. Estimated cost of project, $ 100,000.00
4. Name and address of contractor or builder Improvement of proposed P.W.A. project
5. Photographs looking upstream and downstream from site of proposed structure.

The drawings have been prepared by David C. Boswell
Ridgefield Park License No. 1447
(Give name and address of engineer.)

Respectfully submitted,

Overpeck Brook Valley Joint Meeting Committee

By Geo. T. Walley Chairman

David C. Boswell
Engineer

NOTE: This application, together with drawings and data filed in connection therewith will remain on file in the office of the New Jersey State Water Policy Commission.

New Jersey Division of Water Policy and Supply

Overpeck Tidal Dam
County of Bergen
Dam Application No. 469

Operating Schedule (See specifications)

	Normal pond level	Elev. +1.0
**	Bascule gates will open wide at	Elev. +1.3
***	The Winter gates will open at	Elev. +1.5
***	The Tainter gates will open at	Elev. +1.75
	High water alarm will sound at lake level	Elev. +3.50
	Low water alarm will sound at lake level	Elev. +0.8

* Unless the downstream tide is above Elev. +0.3, in which case the gates will not open until the pond level exceeds the tide level by more than one (1) foot. This minimum differential will be maintained.

** The controls will be such that either gate can be operated independently of the other, and that either gate can be operated manually.

*** The minimum differential between pond level and tide level will be 0.5 of a foot, instead of the 1.0 foot specified for the Bascule gates.

Notes:- All gates will close when the lake level drops to Elev. +1.00. Stoplog gates are designed for manual operation.

Approximate tide data below dam and in Overpeck Creek prior to construction of Tidal Dam:-

Extreme High tide - November 25, 1950	Elev. +7.9
Previous maximum high tide	Elev. +6.8
Design high tide	Elev. +5.0
Mean high tide	Elev. +2.5
Mean low tide	Elev. -3.8

APPENDIX 2

CHECK LIST

VISUAL INSPECTION

OVERPECK TIDAL DAM

Check List
Visual Inspection
Phase 1

Name Dam Overpeck Tidal County Bergen State NJ (00799) Coordinators NJDEP

Date(s) Inspection 2/18/81 4/24/81 Weather Sunny Drizzling off & on Temperature 70° 55°

Pool Elevation at Time of Inspection 1 ft NGVD Tailwater at Time of Inspection 2.5 ft NGVD

Inspection Personnel:

S. Gilman — J. Stone

W. Guinan

R. Murdock

S. Gilman & R. Murdock Recorder

Accompanied by Barry N. Ricciardi, Chief Hydraulic Engineer with County of Bergen

CONCRETE/MASONRY DAMS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SEEPAGE OR LEAKAGE	None observed	
STRUCTURE TO ABUTMENT/EMBANKMENT JUNCTIONS	Good condition, earth-filled caissons or cofferdams of sheet pilings for abutments (surface rust)	
DRAINS	None observed	
WATER PASSAGES	None observed	
FOUNDATION	None observed	

CONCRETE/MASONRY DAMS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS CONCRETE SURFACES	Minor spall on one pier corner	Not structurally significant. Repair would be cosmetic.
STRUCTURAL CRACKING	None observed	
VERTICAL AND HORIZONTAL ALIGNMENT	No misalignments	
MONOLITH JOINTS	All in good condition	
CONSTRUCTION JOINTS	All properly filled	

GATED SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE SILL	Not visible	
APPROACH CHANNEL	Steel sheeting is corroded at the waterline Concrete abutments show evidence of surface erosion exposing coarse aggregate.	
DISCHARGE CHANNEL		
BRIDGE AND PIERS	Good condition	
GATES AND OPERATION EQUIPMENT	Good condition - major repair of electrical and instrumentation system being completed at the time of inspection. No leakage at side seals on mechanical gates. Structural steel stoplog columns are badly rusted at waterline. Stoplogs are weathered on u/s face.	

INSTRUMENTATION

VISUAL EXAMINATION	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
MONUMENTATION/SURVEYS	Not applicable	
OBSERVATION WELLS	Not applicable	
WEIRS	Not applicable	
PIEZOMETERS	Not applicable	
OTHER	Floats and recorders all operating properly for automated gate controls.	

RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	Gentle, minor sloughing, otherwise stable.	
SEDIMENTATION	None observed.	

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTIONS, DEBRIS, ETC.)	Some erosion of right and left channel banks.	
SLOPES	Gentle	
APPROXIMATE NO. OF HOMES AND POPULATION	None	

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION

ITEM	REMARKS
PLAN OF DAM	Plans for "Gate Installations," 1953, for "Reconstruction of Tidal Gates," 1977, and "Annunciator and Alarm Circuits for Tidal Gates" 1980, are on file at New Jersey Department of Environmental Protection, Prospect Street, Trenton, New Jersey 08625.
REGIONAL VICINITY MAP	Prepared for this report
CONSTRUCTION HISTORY	A copy of "Application for Permit for Construction" dated 1938 is included in the "ENGINEERING AND EXPERIENCE DATA," Appendix 1.
TYPICAL SECTIONS OF DAM	See "PLAN OF DAM" above.
HYDROLOGIC/HYDRAULIC DATA	"History of Flooding" and sections of a Flood Hazard Boundary Map are included in Appendix 1.
OUTLETS - PLAN - DETAILS - CONSTRAINTS - DISCHARGE RATINGS	None found
RAINFALL/RESERVOIR RECORDS	None found

ITEM	REMARKS
DESIGN REPORTS	None found
GEOLOGY REPORTS	None found
DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM STABILITY SEEPAGE STUDIES	None found
MATERIALS INVESTIGATIONS BORING RECORDS LABORATORY FIELD	None found
POST-CONSTRUCTION SURVEYS OF DAM	See "PLAN OF DAM" on previous page
BORROW SOURCES	Unknown

ITEM	REMARKS
MONITORING SYSTEMS	None found
MODIFICATIONS	See "PLAN OF DAM"
HIGH POOL RECORDS	None found
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	None found
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	None found
MAINTENANCE OPERATION RECORDS	An operating schedule is included in Appendix 1.

ITEMS	REMARKS
SPILLWAY PLAN	
SECTIONS	None found
DETAILS	
OPERATING EQUIPMENT PLANS & DETAILS	None found

CHECK LIST
HYDROLOGIC AND HYDRAULIC DATA
ENGINEERING DATA

DRAINAGE AREA CHARACTERISTICS: 16.5 square miles, urban, developed

ELEVATION TOP NORMAL POOL (STORAGE CAPACITY): -2.3' NGVD (0 acre-ft)

ELEVATION TOP FLOOD CONTROL POOL (STORAGE CAPACITY): Not applicable

ELEVATION MAXIMUM TEST FLOOD POOL: 1.78' NGVD

ELEVATION TOP DAM: 6.7' NGVD

CREST: New Jersey Turnpike

a. Elevation 11.75 NGVD

b. Type concrete

c. Width 61 feet

d. Length 296.3 feet

e. Location Spillover left end

f. Number and Type of Gates 2 Bascule; 4 Tainter, 7 stoplog

OUTLET WORKS: Six automated gates

a. Type 2 Bascule, 4 tainter gates

b. Location left end of dam

c. Entrance Invert Sill of Bascule gates -1.6; tainter-gates -2.3

d. Exit Inverts Same; same

e. Emergency draindown facilities 13 bays with U/S & D/S stoplog notch such that each bay can be drained.

HYDROMETEOROLOGICAL GAGES: None

MAXIMUM NON-DAMAGING DISCHARGE: 8,323 cfs

APPENDIX 3

PHOTOGRAPHS

OVERPECK TIDAL DAM

April 24, 1981

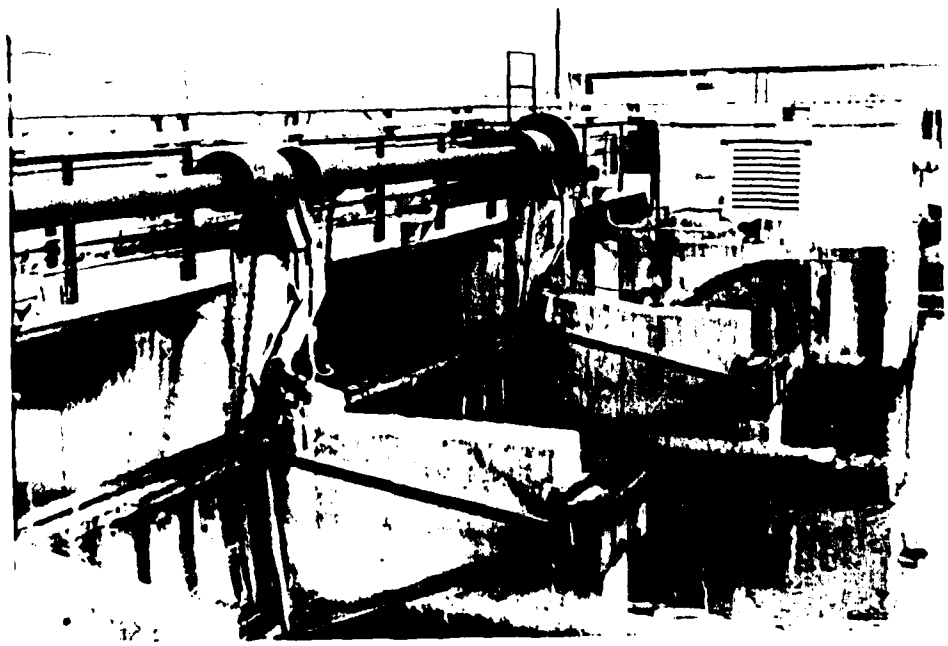
Looking upstream from New Jersey Turnpike, near center of dam.

April 24, 1981

Sheet pile walls lining approach channel on right side of dam.

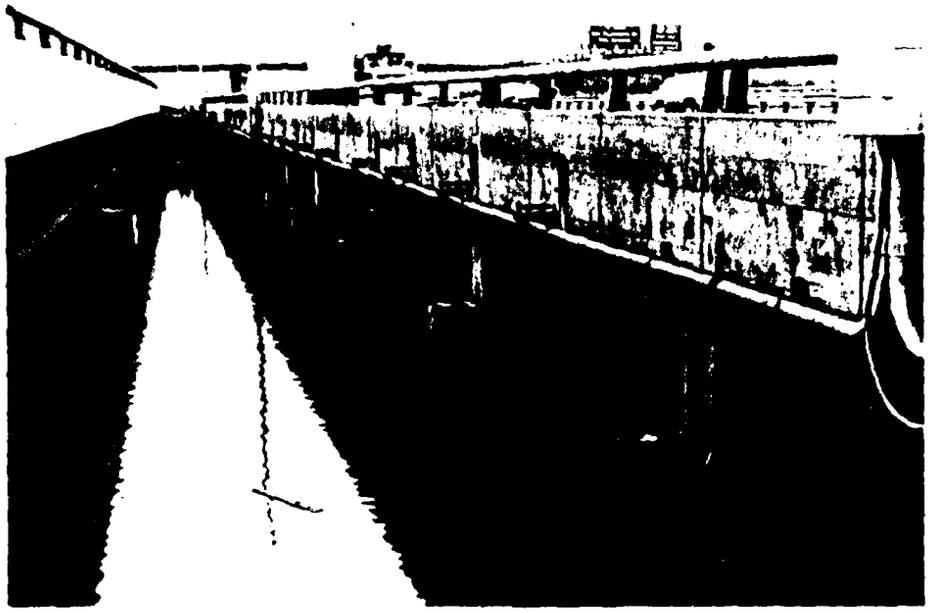
April 24, 1981

Left-end Tainter gate and left caisson abutment from upstream riverine side.



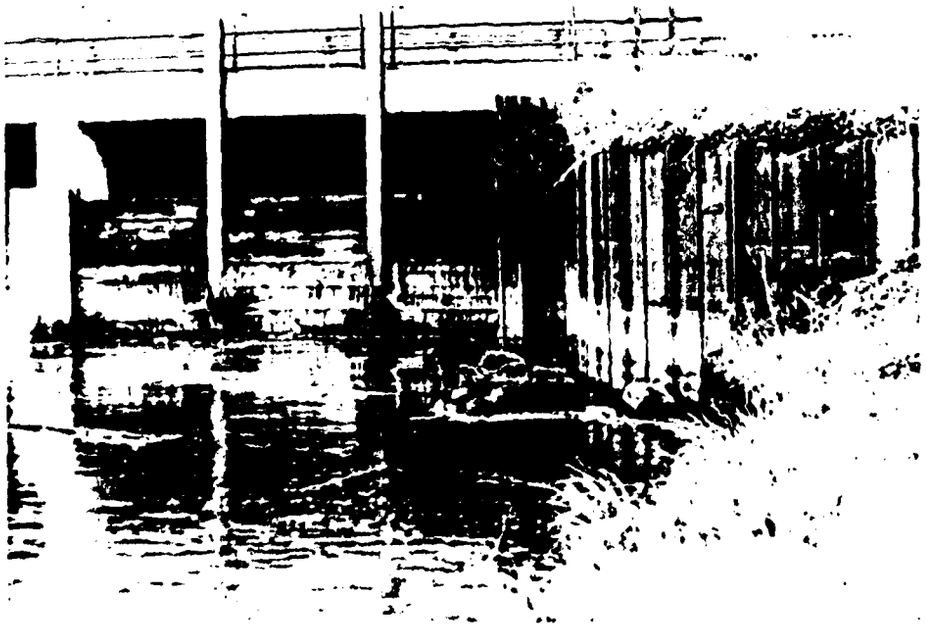
February 18, 1981

Control house and left side bascule gate and two Tainter gates.



April 24, 1981

Upstream stoplog sections. Caissons at right are used as part of right abutment for dam and bridge support. Note slots upstream in concrete supports for dropping temporary gates while servicing stoplogs or dewatering bays under bridge.



April 24, 1981

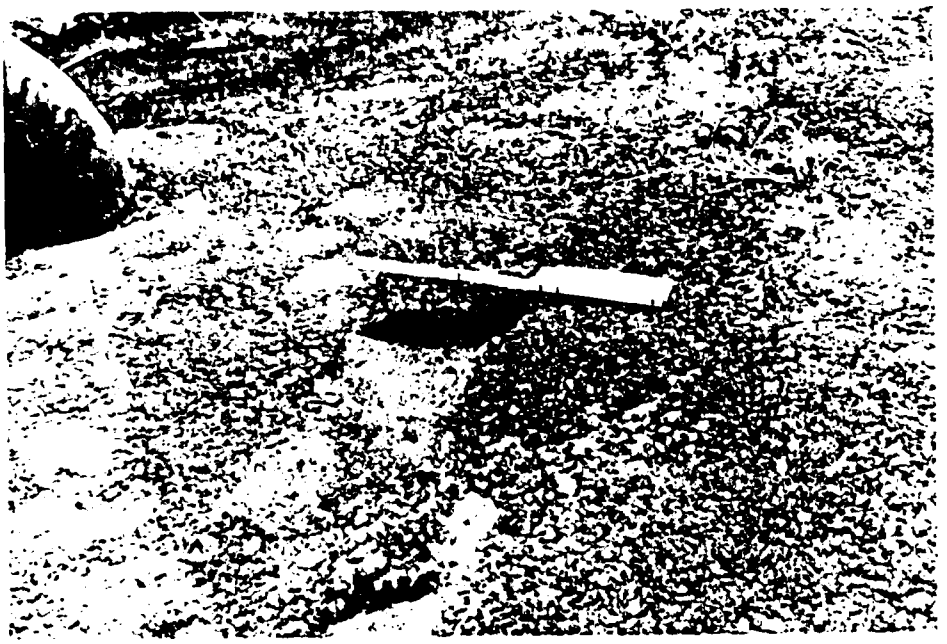
Upstream face of dam along right side.

April 24, 1981

Right abutment at downstream edge of dam.

April 24, 1981

Dumped rock adjacent to sheet pile walls (right side - downstream).



April 24, 1981

Erosion of asphalt surface adjacent to cofferdam on left side of dam.

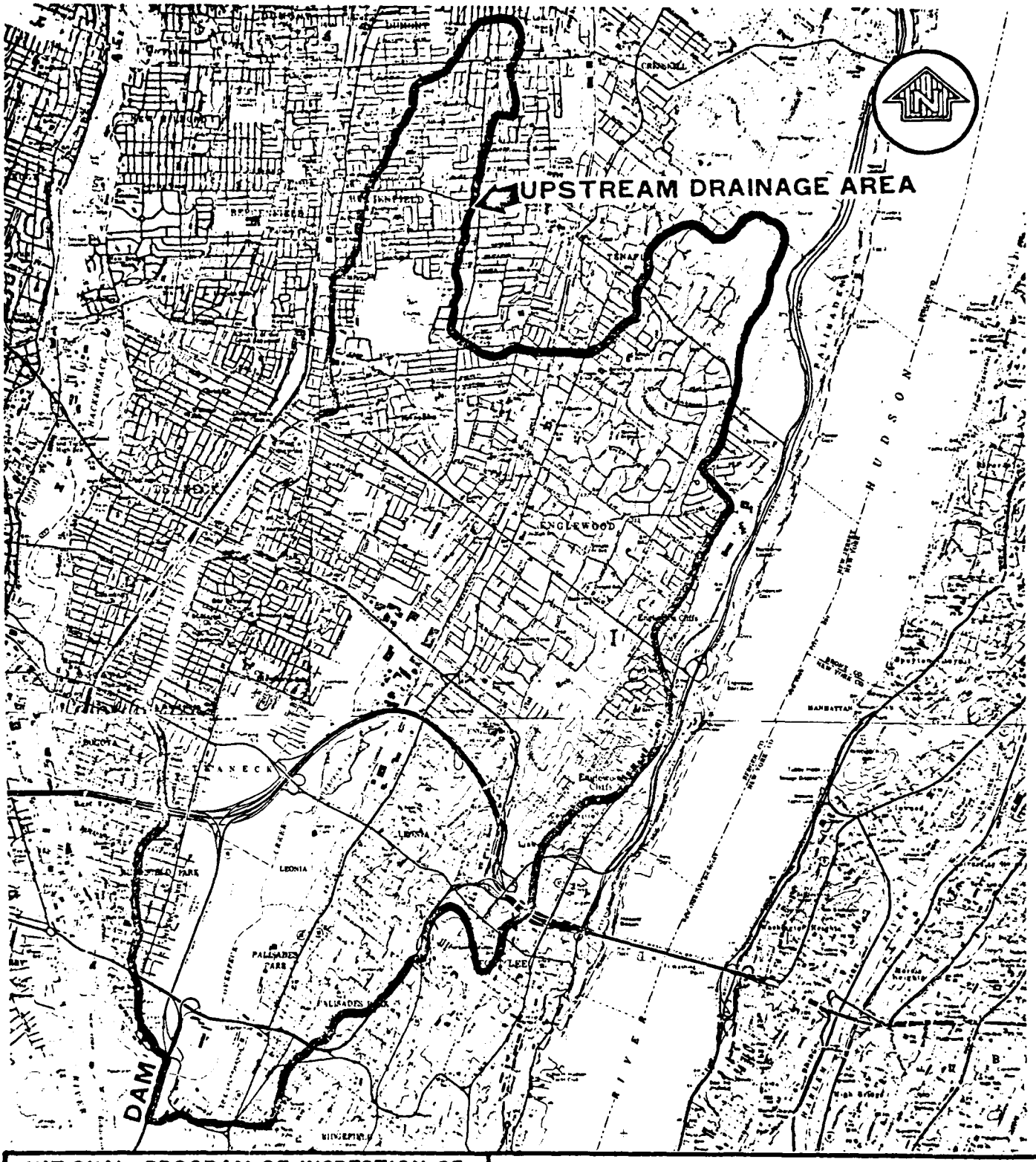
April 24, 1981

Looking downstream at downstream channel - tidewater - No downstream hazard.

APPENDIX 4

HYDROLOGIC COMPUTATIONS

OVERPECK TIDAL DAM



NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS

OVERPECK TIDAL DAM

RIDGEFIELD BOROUGH, NEW JERSEY

REGIONAL VICINITY MAP

JUNE 1981

DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
PHILADELPHIA, PENNSYLVANIA

Anderson-Nichols & Company, Inc. BOSTON, MA.

SCALE IN MILES

0 1 2

MAP BASED ON U.S.G.S. 7.5 MINUTE QUADRANGLE SHEETS. WEEHAWKEN, N.J., N.Y. 1967. CENTRAL PARK, N.Y., N.J. 1966, REVISED 1979. YONKERS, N.J., N.Y. 1966. HACKENSACK, N.J. 1955, REVISED 1970.

Anderson-Nichols & Company, Inc. Subject Overpeck Tidal Sheet No. 1 of 7
Date 7/21/87
Computed [illegible]
Checked [illegible]
JOB NO.

Stankowski Equations

$$Q_{100} = 136\ A^{0.84}\ S^{0.26}\ S_\ell^{-0.51}\ I^{0.14}$$

A: area in square miles = 16.5

S: slope in ft/mi

Length upstream = 40,000 ft
10% @ 4,000 ft → el = 0 (estimated)
85% @ 34,000 ft → el = 120'

$$S = \frac{120 - 0}{30{,}000/5280} = 21.1 \text{ ft/mi}$$

$$S_\ell = \frac{\text{Area of lakes and swamps}}{\text{total area}} \times 100 + 1$$

Area of lakes & swamps = 0.549 mi²

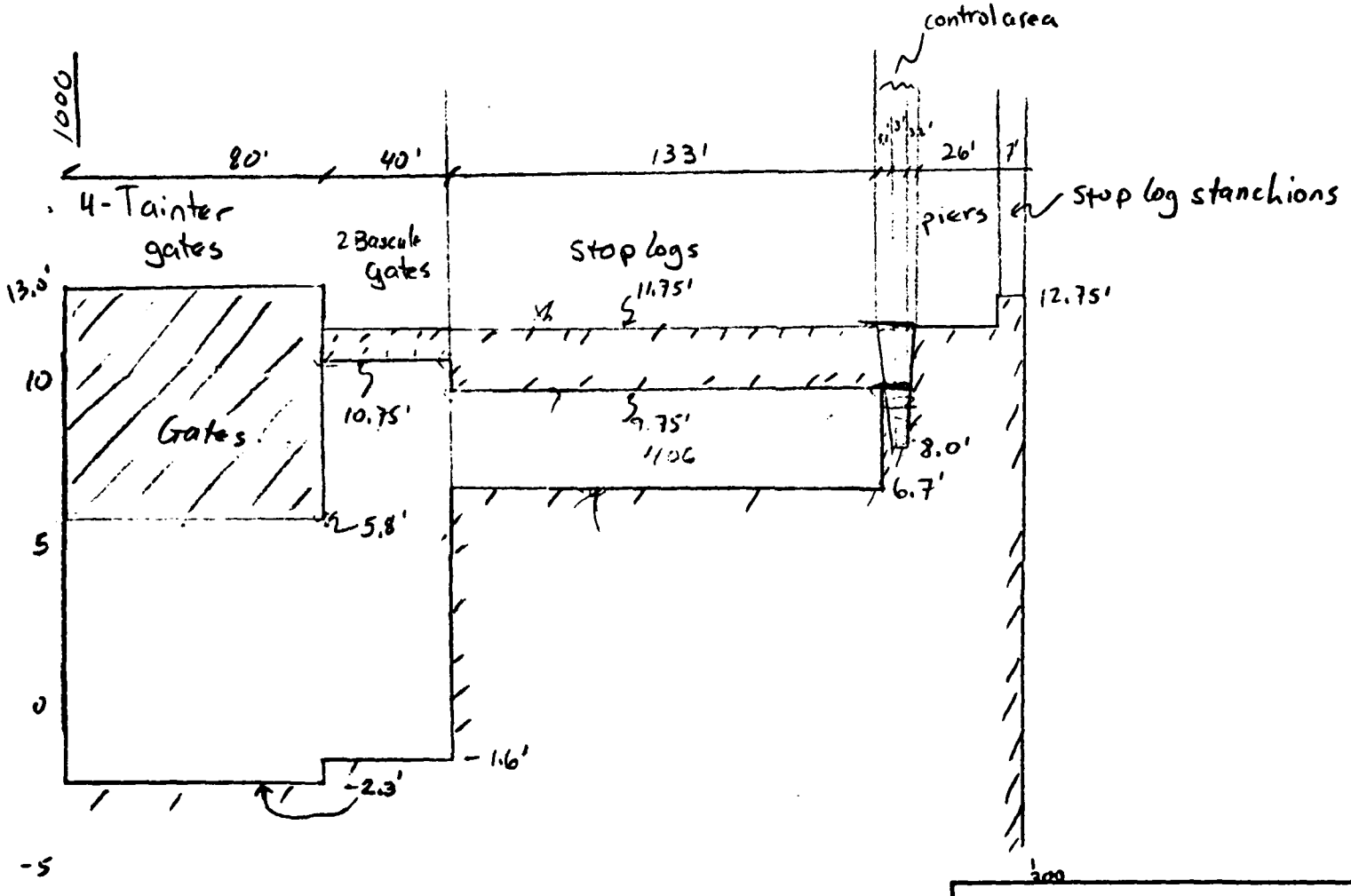
$$S_\ell = \frac{0.549}{16.5} \times 1 = 4.33$$

I = index of imperviousness = percent = 30

$$Q_{100} = 136\ (16.5)^{0.84}\ (21.1)^{0.26}\ (4.33)^{-0.51}\ (30)^{0.14}$$

$$= 2,414 \text{ cfs}$$

Neglecting storage effects, which would further decrease flow, the stage with no tailwater affect would be 1.7' NGVD, well below the dam crest at 6.7'. Even with some tailwater affect, the dam should not be overtopped.



ANDERSON-NICHOLS

VERNON BOSTON CONCORD

Overpeck - Representative Dam
Elevation - All Gates Open
Assume negligible Pier Effects

DATE	SCALE	JOB NO.	SHEET NO.

2 OF 7

SQUARES 1/4 IN. SCALE

Stage versus Discharge

Assume: 1) Tainter gates open - broad crested weir
2) Bascule gates down - broad-crested weir
3) Stop logs in place
4) downstream water level at low tide (-2.3 NGVD).

$$Q_{Bascule} = 2 \times C L H^{3/2}$$

C = 2.64, L = 20', H = Elev + 1.6 (Elev = Water Elevation)

$$Q_{Basc} = 2\,(2.64)\,(20)\,(E+1.6)^{3/2}$$

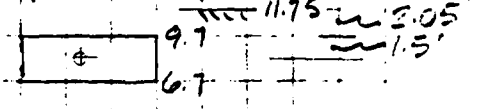
$$Q_{Tainter} = 4 \times C L H^{3/2} = 4\,(2.64)(20)(E+2.4)^{3/2}$$

Elevation (Ft. above NGVD)	$Q_{BASCULE}$ (CFS)	$Q_{TAINTER}$ (CFS)	Q_{TOTAL} (CFS)
-2.4	0	0	0
-2.0	0	53	53
-1.0	49	350	399
0	214	785	999
1.0	443	1,325	1,768
2.0	721	1,949	2,670
3.0	1,042	2,650	3,692
4.0	1,399	3,420	4,819
5.0	1,791	4,251	6,042
6.0	2,213	5,142	7355
6.7	2,525	5,798	8,323

DISCHARGE @ TOP OF STOPLOGS (ELEV 11.75' NGVD)

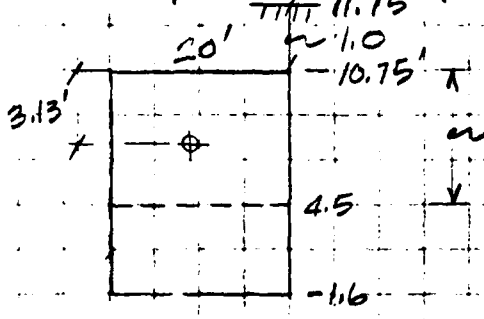
ASSUME: 1. TAINTER & BASCULES COMPLETELY OPEN
2. STOPLOGS IN PLACE
3. TIDE ELEV. = 4.5' NGVD

$Q_{stplgs} = 7 \times CA\sqrt{2gh} = 7 \times 0.8(10 \times 3)\sqrt{2(32.2)(3.55)}$



$Q_{stplgs} = 4572$ CFS

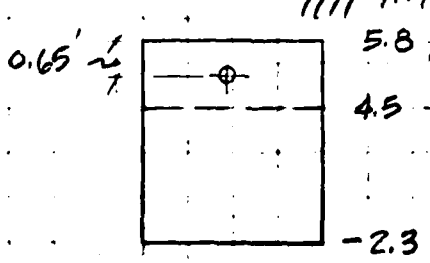
$Q_{BASCULE} = 2\text{ gates} \times CA\sqrt{2gh}$



$= 2 \times 0.8(6.25 \times 20)\sqrt{2(32.2)(4.13)}$

$Q_{BASCULE} = 3262$ CFS

$Q_{TAINTER} = 4\text{ gates} \times CA\sqrt{2gh}$



$= 4 \times 0.8(1.3 \times 20')\sqrt{2(32.2)(6.6')}$

$Q_{TAINTER} = 1715$ CFS

Anderson-Nichols & Company, Inc.

Subject: OVERPECK TIDAL

Sheet No. 5 of 7

Date: 29 AUG 91

Computed: JRL

Checked: KFS

Job No.

$Q_{TOTAL} = Q_{ESTIMATE} + Q_{RESERVOIR} + Q_{WATER}$

$= 4572 + 3262 + 1715$

$= 9549$ CFS

$Q_{TOTAL\ @\ TOP\ OF\ DAM\ (11.75)} =$

$Q_{TEST\ FLOOD} = 2414$ CFS

$\therefore$ 100% OF TEST FLOOD CAN BE PASSED

Anderson-Nichols & Company, Inc.

Subject [illegible]

Sheet No. 6 of [illegible]
Date [illegible]
Computed
Checked [illegible]

JOB NO. [illegible]

SQUARES 1/4 IN. SCALE 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29

1 inch - [illegible] ft.
1 sq. in [illegible]

[illegible]
5250 [illegible] ft²/in²

[illegible]34 sq. mi.

Normal pool
at [illegible] .575 [illegible]
10' 116 YD
10 ft 22.46 sq. in. 3.[illegible]

from [illegible]

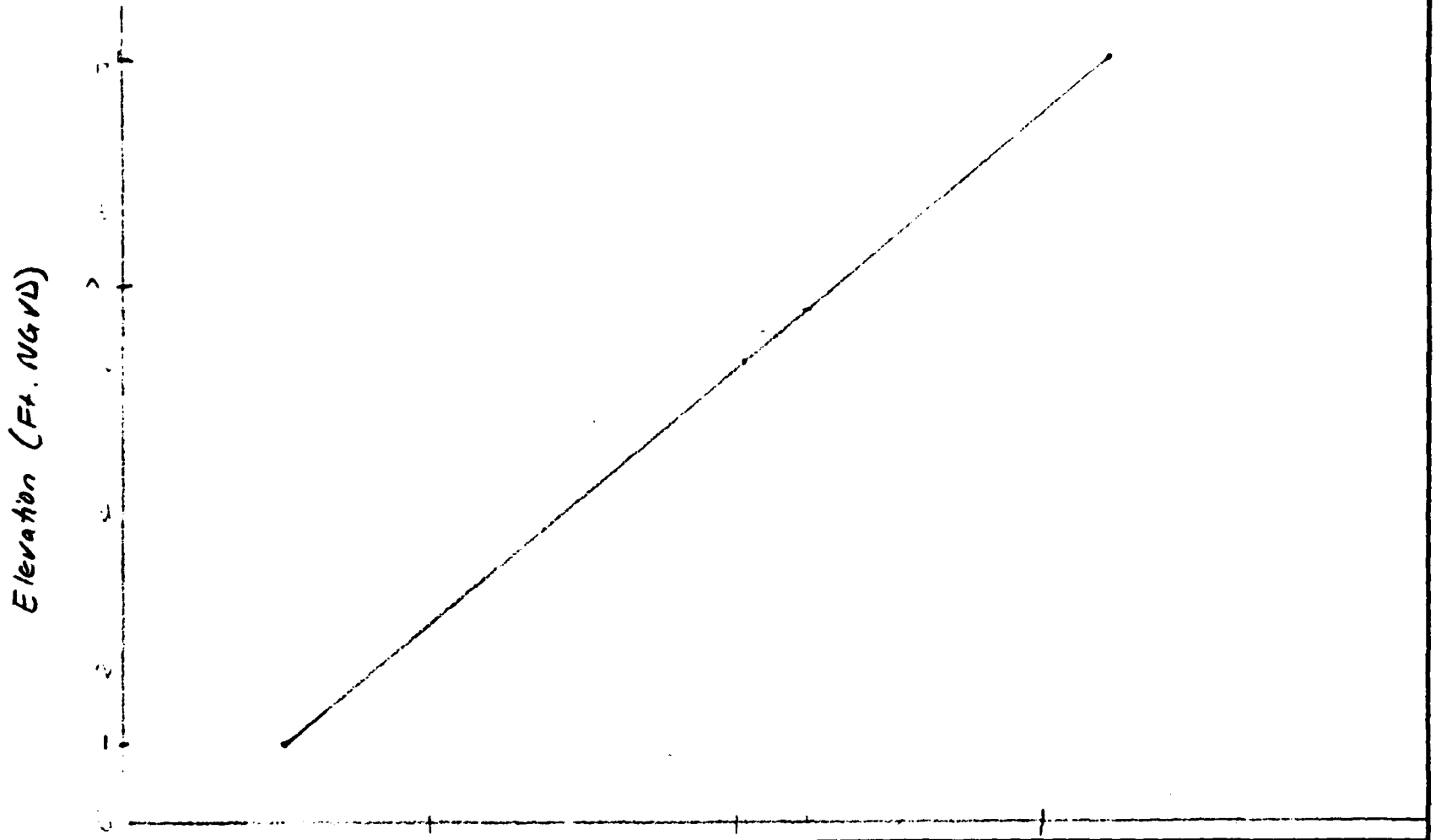
sq. [illegible] acres

[illegible] 1 ft = 36[illegible]
6 ft [illegible]

[illegible]

Area at 1 [illegible]

= 510.6 [illegible]



ANDERSON-NICHOLS

VERNON BOSTON CONCORD

Overpeck Tidal Dam
Surface Area Vs. Stage

DATE	SCALE:	JOB NO.	SHEET NO.
7/7/21			

7 of 7

APPENDIX 5

REFERENCES

OVERPECK TIDAL DAM

APPENDIX 5
REFERENCES

OVERPECK TIDAL DAM

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